

SEQUENCE LISTING

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TAMURA, TOMOHIRO

<120> METHOD OF PRODUCING RECOMBINANT PROTEIN IN BACTERIUM
BELONGING TO GENUS RHODOCOCCUS

<130> 081356-0253

<140> 10/553,979

<141> 2005-10-20

<150> PCT/JP04/005585

<151> 2004-04-19

<150> JP 2003116280

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<160> 168

<170> PatentIn Ver. 3.3

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primer sHN1

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25

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<210> 9
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<210> 10
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primer sHN10

<400> 10
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<210> 11
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<210> 12
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primer sHN40

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<210> 14
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primer sHN42

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<210> 16
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primer sHN55

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<210> 18
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primer sHN56

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primer sHN57

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primer sHN58

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<210> 21
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 primer sHN39

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 primer sHN141

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<210> 28
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 primer sHN142

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 primer sHN145

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<210> 30
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 primer sHN152

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<210> 31
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 primer T7

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<210> 32
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 primer sHN153

<400> 32
 aatccacagg acgggtgtgg 20

<210> 33
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 primer sHN154

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<210> 34
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primer T3

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22

<210> 35

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primer sHN155

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<210> 36

<211> 19

<212> DNA

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<223> Description of Artificial Sequence: Synthetic
primer sHN156

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primer sHN110

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gcctcct 67

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 tagatctcga ggatgaa 77

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 primer NNco2

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 primer CNco1

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 primer CNco2

<400> 41
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<210> 42
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 primer sHN159

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<211> 80
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primer NNde1

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gcttagatct cgaggatgaa 80

<210> 44
<211> 82
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primer NNde2

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primer CNde1

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<210> 48
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 primer sHN343

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<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic vector
pTip-LNH2 sequence

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<210> 59
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<210> 62

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<223> Description of Artificial Sequence: Synthetic
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primer sHN362

<400> 66
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<210> 67
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primer sHN363

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<210> 68
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primer sHN364

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<210> 69
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primer sHN368

<400> 69
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<210> 70
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 primer sHN373

<400> 70
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<223> Description of Artificial Sequence: Synthetic
primer MCS-2b

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<223> Description of Artificial Sequence: Synthetic
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<211> 28

<212> DNA

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primer sHN396

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 primer sHN397

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 primer sHN147

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 primer sHN376

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 primer sHN388

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<223> Description of Artificial Sequence: Synthetic
primer SHN338

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<210> 88

<211> 20

<212> DNA

<213> Artificial Sequence

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<210> 89

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<212> DNA

<213> Artificial Sequence

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primer SHN340

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<211> 8207

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
vector pTip-QT1 sequence

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 vector pTip-QT2 sequence

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<212> DNA

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<220>

<223> Description of Artificial Sequence: Synthetic
vector pTip-QC1 sequence

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| ggacaccatc | gcaaatccgt | ccgatcccgc | ggtgcagcgg | atcatcgatg | tcaccaagcc | 240 |
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| gttgctggat | ctgtgcgggc | ggcagaacat | accggtccgc | ctcatcgact | cctcgatcgt | 420 |
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| gatcatcctg | gtggacagtg | acatcaccag | catcgcggac | cggcgtctcc | aaagggccag | 660 |
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<223> Description of Artificial Sequence: Synthetic
vector pTip-QC2 sequence

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<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
vector pNit-QT1 sequence

<400> 99

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<211> 5988

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<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
vector pNit-QT2 sequence

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| cccgcagtac | gccactgcgc | tacgcccacc | gcatcgaaac | cggcctcaag | atcagcgtcg | 4980 |
| gcggcgattt | cgcgtatggc | gggcaactga | ccaaaacccc | gattcacccc | gattgggaga | 5040 |
| cgatctacgg | cccggccacc | ccgtacacat | tgcggcagct | ggccaccatc | cacacacccc | 5100 |
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| acgccaccgg | gcgatgggca | taccgcagct | ggtggcaaca | ccgaaacgga | accggccgcg | 5220 |
| actgggacca | tctcgtcctg | cagcactgcc | acgccgtcaa | caccgagttc | acgacaccac | 5280 |
| tgcggttcac | cgaagtacgc | gccaccgcgc | aatccatctc | caaattggatc | tggcgcaatt | 5340 |
| tcaccgaaga | caagtaccga | gcccgacaag | cgcactctcg | tcaaaaaggc | ggcaaggcaa | 5400 |
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| tgcgagagggc | gattatctga | tgggaggagc | caaaaatccg | gtgcgccgaa | agatgacggc | 5520 |
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| tcgactgaag | tatgagcaac | gtcacagcct | gtgattggat | gatccgctca | cgctcgaccg | 5940 |
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<211> 6058

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
vector pNit-RT1 sequence

<400> 101

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| ccccggagcc | tgcatggggc | attccgccgt | gaaccgggtg | gaatgcccc | ggcaccggg | 120 |
| ctttccagca | aagatcacct | ggcgccgatg | agtaaggcgt | acagaaccac | tccacaggag | 180 |
| gaccgtcgag | atgaaatcta | acaatgcgct | catcgtcatc | ctcggcaccg | tcaccctgga | 240 |
| tgtgttaggc | ataggcttgg | ttatgccggg | actgccgggc | ctcttgccgg | atatcgtcca | 300 |
| ttccgacagc | atcgccagtc | actatggcgt | gctgctagcg | ctatatgctg | tgatgcaatt | 360 |
| tctatgcgca | ccggttctcg | gagcaactgtc | cgaccgcttt | ggccgcggcc | cagtctgtgt | 420 |
| cgcttcgcta | cttggagcca | ctatcgacta | cgcgatcatg | gcgaccacac | ccgtcctgtg | 480 |
| gattctctac | gccggacgca | tcgtggccgg | catcaccggc | gccacagggtg | cggttgctgg | 540 |
| cgcttatatc | gccgacatca | ccgatgggga | agatcggggt | cgccacttcg | ggctcatgag | 600 |
| cgcttgtttc | ggcgtgggta | tgggtggcagg | ccccgtggcc | gggggactgt | tgggcgccat | 660 |
| ctccttgcat | gcaccattcc | ttgcggcgcc | ggtgctcaac | ggcctcaacc | tactactggg | 720 |
| ctgcttccta | atgcaggagt | cgcataaggg | agagcgctcg | ccgatgccct | tgagagcctt | 780 |
| caaccacgtc | agctccttcc | ggtgggcgcg | gggcatgact | atcgtcgccg | cacttatgac | 840 |
| tgtcttcttt | atcatgcaac | tcgtaggaca | ggtgccggca | gcgctctggg | tcattttcgg | 900 |
| cgaggaccgc | tttcgctgga | gcgcgacgat | gatcggcctg | tcgcttgccg | tattcggaat | 960 |
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| gcaggccatt | atcgccggca | tggcgccgca | cgcgctgggc | tacgtcttgc | tggcgctcgc | 1080 |
| gacgcgaggc | tggatggcct | tccccattat | gattcttctc | gcttccggcg | gcatcgggat | 1140 |
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| accagaaaac | cggtgtgaaa | gtaaaagatg | ctgaagatca | gttgggtgca | cgagtgggtt | 1860 |
| acatcgaact | ggatctcaac | agcggtaaga | tccttgagag | ttttcgcccc | gaagaactgt | 1920 |
| ttccaatgat | gagcactttt | aaagttctgc | tatgtggcgc | ggtattatcc | cgtattgacg | 1980 |
| ccgggcaaga | gcaactcggt | cgccgcatac | actattctca | gaatgacttg | ggtgagtact | 2040 |
| caccagtcac | agaaaagcat | cttacggatg | gcattgacagt | aagagaatta | tgcagtgtctg | 2100 |
| ccataacat | gagtataaac | actgcggcca | acttacttct | gacaacgatc | ggaggaccga | 2160 |
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| atTTTTaatt | taaaaggatc | taggtgaaga | tcctttttga | taatctcatg | accaaaatcc | 2700 |
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<220>

<223> Description of Artificial Sequence: Synthetic
vector pNit-RT2 sequence

<400> 102

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<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
vector pNit-QC1 sequence

<400> 103

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<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic
vector pNit-QC2 sequence

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| gacaggtatc | cggtaaagcg | cagggctcgga | acaggagagc | gcacgagggg | gcttccaggg | 3420 |
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| gattctgtgg | ataaccgtat | taccgccttt | gagtgagctg | ataccgctcg | ccgcagccga | 3660 |
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| gcctctggcg | cagcgtcagc | taccgcccga | ggcctgtcat | cgaccggctt | cgactgaagt | 6060 |

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<211> 6227

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
vector pNit-RC1 sequence

<400> 105

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| | | | | | | |
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<210> 106

<211> 6231

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
vector pNit-RC2 sequence

<400> 106

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tttattgctg ataaatctgg agccgggtgag cgtgggtctc gcggtatcat tgcagcactg 2640

| | | | | | | |
|-------------|------------|-------------|-------------|-------------|-------------|------|
| gggccagatg | gtaagccctc | ccgtatcgta | gttatctaca | cgacggggag | tcaggcaact | 2700 |
| atggatgaac | gaaatagaca | gatcgctgag | ataggtgcct | cactgattaa | gcattggtaa | 2760 |
| ctgtcagacc | aagtttactc | atatatactt | tagattgatt | taaaacttca | tttttaattt | 2820 |
| aaaaggatct | aggtgaagat | cctttttgat | aatctcatga | ccaaaatccc | ttaacgtgag | 2880 |
| ttttcgttcc | actgagcgtc | agaccccgtg | gaaaagatca | aaggatcttc | ttgagatcct | 2940 |
| ttttttctgc | gcgtaatctg | ctgcttgcaa | acaaaaaaac | caccgctacc | agcgggtggt | 3000 |
| tgtttgcccg | atcaagagct | accaactctt | tttccgaagg | taactggctt | cagcagagcg | 3060 |
| cagataccaa | atactgttct | tctagtgtag | ccgtagttag | gccaccactt | caagaactct | 3120 |
| gtagcaccgc | ctacatacct | cgctctgcta | atcctgttac | cagtggctgc | tgccagtggc | 3180 |
| gataagtcgt | gtcttaccgg | gttggaactca | agacgatagt | taccggataa | ggcgcagcgg | 3240 |
| tccggctgaa | cggggggttc | gtgcacacag | cccagcttgg | agcgaacgac | ctacaccgaa | 3300 |
| ctgagatacc | tacagcgtga | gctatgagaa | agcgccacgc | ttcccgaagg | gagaaaaggcg | 3360 |
| gacaggtatc | cggtaagcgg | cagggctcgga | acaggagagc | gcacgagggg | gcttccaggg | 3420 |
| ggaaacgcct | ggatatctta | tagtcctgtc | gggtttcgcc | acctctgact | tgagcgtcga | 3480 |
| tttttgtgat | gctcgtcagg | ggggcgggagc | ctatggaaaa | acgccagcaa | cgcggccttt | 3540 |
| ttacggttcc | tggccttttg | ctggcctttt | gtcacatgt | tctttcctgc | gttatccctt | 3600 |
| gattctgtgg | ataaccgtat | taccgccttt | gagtgtgctg | ataccgctcg | ccgcagccga | 3660 |
| acgaccgagc | gcagcgagtc | agtgtgagcg | gaagcgggag | agcgcccaat | acgcaaaccg | 3720 |
| cctctccccg | cgcgttgccc | gattcattaa | tgcagctggc | acgactagag | tcccgcctgag | 3780 |
| gcggcgttagc | aggtcagccg | ccccagcggg | ggtcaccaac | cgggggtggaa | cggcgccggg | 3840 |
| atcgggtgtg | tccgtggcgc | tcattccaac | ctccgtgtgt | ttgtgcagggt | ttcgcgtggt | 3900 |
| gcagtccctc | gcaccggcac | ccgcagcggg | gggtcacggg | gtgccgggtg | gtcgactagt | 3960 |
| tcagtgtatg | tgatggtgat | gctcgagaga | tctaagcttg | gatccgcggc | cgctacgtag | 4020 |
| aattcccatg | gcgtgatggt | gatggtgatg | gccccatatg | atatctcctt | cttaaagtta | 4080 |
| aacaaaatta | tttctagacg | ccgtccatta | tacctcctca | cgtgacgtga | ggtgcaagcc | 4140 |
| cggacgttcc | gcgtgccacg | ccgtgagccg | ccgcgtgccg | tcggctccct | cagcccgggc | 4200 |
| ggccgtggga | gccccctcgc | atatgtacaa | cgatggggac | tcgccgcgga | ctagcggctt | 4260 |
| cccgaacgcg | cgtactgacc | agcagatcag | cgataaacgc | tgtttctgct | ggttaagtgg | 4320 |
| ataaaaaacca | aataatcgat | gaacctcgaa | gtggagtatc | cgagctgaac | tagctggatt | 4380 |
| tactccgaaa | atacgagcgg | cgacgaaggg | tgttggacca | ccctgccgcc | gccttcgagg | 4440 |
| ctcctacttg | actaggaccc | cgctcgttat | gaccagcgta | agtgtgaac | acctttccgg | 4500 |
| caaagaccgg | ccccctgtcc | tcgtgtcgtc | cgataagcgc | ggcatccggc | acgaacttcg | 4560 |
| acccaaactt | caacaaatca | ccacgtcaga | aacttttaat | gcgtgcccgc | ggccgatttc | 4620 |
| cggcgtgaac | ggtgtgacca | tcgtcaacgg | tcccaaaggt | tccggatttg | gaggccttcg | 4680 |
| ctcctgcgga | aagggtcgga | tctgcccctg | ctgtgcggga | aaagtccggc | cacatcgagc | 4740 |
| agacgaaatt | tctcaagttg | ttgtcatca | actcgggact | ggatctgttg | cgatggtgac | 4800 |
| catgaccatg | cgccataccg | ctgggcagcg | tttgcatgat | ttgtggactg | gactttccggc | 4860 |
| agcctggaaa | gctgcgacca | atggccgccc | atggcgtacc | gaacgtgaaa | tgtacggctg | 4920 |
| cgacggatac | gtacgagctg | ttgaaatcac | tcacggaaaa | aacggttggc | acgttcacgt | 4980 |
| ccacgctcta | ctcatgttca | gcggtgacgt | gagtgagaac | atcctcgaat | ccttctcgga | 5040 |
| tgcgatgttc | gatcgttgga | cctccaaact | cgtgtctctg | ggatttgctg | cgccactacg | 5100 |
| taattcaggt | ggactcgacg | taagaaagat | tggtggagaa | gctgaccaag | ttctcgtcgc | 5160 |
| atacctgacg | aaaattgcat | ccggggctcg | catggaagtc | ggcagtgccg | acggaaaaag | 5220 |
| tggtcggcac | ggcaaccgtg | caccttgga | aatcgccgtt | gatgcagtcg | gaggagatcc | 5280 |
| acaagcgttg | gaactctggc | gcgagtttga | gttcggttcg | atgggacgcc | gagcaatcgc | 5340 |
| atggtctcgt | ggactgcgcg | cccagctggg | tcttgccgta | gaactcacgg | atgctcagat | 5400 |
| tgtcgaacag | gaagaatctg | ccccggctcat | ggttcgcatc | attccggctc | ggtcctggat | 5460 |
| gatgattcgg | aactgtgcgc | cttacgtttt | cggagagatc | cttggaactcg | tggaaagcggg | 5520 |
| cgcgacctgg | gaaaaccttc | gtgaccactt | gcattatcga | ttgcctgcag | cggatgtgcg | 5580 |
| gcctccgata | atatcgattc | gtaagtgaat | tgtcttggtg | tgcaacaact | ttcactcgta | 5640 |
| tgaaccacac | ttgagggcat | ccccccgata | cttgcgcgtt | tgaagctggg | tgtctctctg | 5700 |
| tcagggctgc | gatagcaccg | cgtagcggct | tggccttgac | agagagacgg | cctgtttcat | 5760 |
| ggttggtctc | ggggggctga | ccgggcagat | agaaaaaggc | cggccgattt | ggctgccgac | 5820 |
| tatttttgca | ggtaaaccca | tctcatgagc | atcaatgaac | gtcccgttgg | tatcgacgag | 5880 |
| aatgcagctt | cggtagacgt | cgatggcgtt | gtgatgggtg | tgtatctctc | gctttatggg | 5940 |
| caagaatcct | cgatagatcg | agatgatgag | ttcctactcc | tcgacgcact | tcaggacgcg | 6000 |
| ttgcgacctc | aagccaacta | agaacctcgc | agatgggtcta | aacgaggcgc | aaactcgtct | 6060 |
| ctgggcctgc | gggcggagca | ccgaagcgcg | agcgaagcgg | agcgcgtagg | tgggggagcc | 6120 |

tgcgggcagc ggccggcggag ccgcccgcctt ggtaataggt gatcatcggg gccatagcag 6180
gtcagaggat gtttttacga tgactcatgc tcaccacgcc aagtactgat g 6231

<210> 107
<211> 124
<212> DNA
<213> *Rhodococcus erythropolis*

<220>
<223> mutated TipA gene promoter

<400> 107
cgcccgggct gagggagccg acggcacgcg gcggctcacg gcgtggcacg cggaacgtcc 60
gggcttgac ctcacgtcac gtgaggaggt ataatggacg gcgtcagaga aggggacggc 120
catg 124

<210> 108
<211> 422
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
nucleotide sequence

<220>
<221> CDS
<222> (151)..(222)

<400> 108
gtgtacatat cgaggcgggc tcccacggcc gcccgggctg agggagccga cggcacgcgg 60
cggtcacgg cgtggcacgc ggaacgtccg ggcttgacc tcacgtcacg tgaggaggca 120
gcgtggacgg cgtcagagaa gggagcggcc atg ggc cac cat cac cat cac cat 174
Met Gly His His His His His His
1 5

atg gga att cta cgt agc ggc cgc gga tcc aag ctt aga tct cga gga 222
Met Gly Ile Leu Arg Ser Gly Arg Gly Ser Lys Leu Arg Ser Arg Gly
10 15 20

tgaactagtc gaccacccgg caccctgag cccctcgtg cgggtgccg tgcgagggac 282
tgcaacacgc gaaacctgca caaacacacg gaggttgaa tgagcgccac ggacacaccc 342
gataccggcg ccgttccacc ccggttggtg accaccgctg gggcggctga cctgctacgc 402
cgctcagcg ggactctagt 422

<210> 109
<211> 24
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 109

Met Gly His His His His His His Met Gly Ile Leu Arg Ser Gly Arg
 1 5 10 15

Gly Ser Lys Leu Arg Ser Arg Gly
 20

<210> 110

<211> 42

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic nucleotide sequence

<400> 110

gtctagaaat aattttgttt aactttaaga aggagatata cc 42

<210> 111

<211> 416

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic nucleotide sequence

<220>

<221> CDS

<222> (151)..(216)

<400> 111

gtgtacatat cgaggcgggc tcccacggcc gcccgggctg agggagccga cggcacgcgg 60

cggctcacgc cgtggcacgc ggaacgtccg ggcttgacc tcacgtcacg tgaggaggca 120

gcgtggacgc cgtcagagaa gggagcggcc atg gga att cta cgt agc ggc cgc 174

Met Gly Ile Leu Arg Ser Gly Arg
 1 5

gga tcc aag ctt aga tct cga gga cat cac cat cac cat cac 216

Gly Ser Lys Leu Arg Ser Arg Gly His His His His His His
 10 15 20

tgaactagtc gacccaccgc caccgtgag ccctcgctg cgggtgccgc tgagaggac 276

tgcaacacgc gaaacctgca caaacacacg gaggttgga tgagcgccac ggacacaccc 336

gataccggcg ccgtccacc ccggttggtg accaccgctg gggcggctga cctgctacgc 396

cgcctcagcg ggactctagt 416

<210> 112
 <211> 22
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 112
 Met Gly Ile Leu Arg Ser Gly Arg Gly Ser Lys Leu Arg Ser Arg Gly
 1 5 10 15
 His His His His His His His
 20

<210> 113
 <211> 42
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 nucleotide sequence

<400> 113
 gtctagaaat aattttgttt aactttaaga aggagatata cc 42

<210> 114
 <211> 425
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 nucleotide sequence

<220>
 <221> CDS
 <222> (151)..(225)

<400> 114
 gtgtacatat cgaggcgggc tcccacggcc gcccgggctg agggagccga cggcacgcgg 60
 cggctcacgg cgtggcacgc ggaacgtccg ggcttgacc tcacgtcacg tgaggaggca 120
 gcgtggacgg cgtcagagaa gggagcgcac atg ggc cat cac cat cac cat cac 174
 Met Gly His His His His His His
 1 5
 gcc atg gga att cta cgt agc ggc cgc gga tcc aag ctt aga tct cga 222
 Ala Met Gly Ile Leu Arg Ser Gly Arg Gly Ser Lys Leu Arg Ser Arg
 10 15 20

gga tgaactagtc gacccaccgg caccogtgag ccctcgctg cgggtgccgg 275
 Gly
 25

tgcgagggac tgcaacacgc gaaacctgca caaacacacg gaggttgga tgagcgccac 335
 ggacacaccc gataccggcg ccgttccacc ccggttggtg accaccgctg gggcggtga 395
 cctgctacgc cgcctcagcg ggactctagt 425

<210> 115
 <211> 25
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 115
 Met Gly His His His His His His Ala Met Gly Ile Leu Arg Ser Gly
 1 5 10 15
 Arg Gly Ser Lys Leu Arg Ser Arg Gly
 20 25

<210> 116
 <211> 43
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 nucleotide sequence

<400> 116
 gtctagaaat aattttgttt aactttaaga aggagatata cat 43

<210> 117
 <211> 416
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 nucleotide sequence

<220>
 <221> CDS
 <222> (151)..(216)

<400> 117
 gtgtacatat cgaggcgggc tcccacggcc gcccgggctg agggagccga cggcacgcgg 60
 cggctcacgg cgtggcacgc ggaacgtccg ggcttgacc tcacgtcacg tgaggaggca 120

gcgtggacgg cgtcagagaa gggagcgcat atg gga att cta cgt agc ggc cgc 174
 Met Gly Ile Leu Arg Ser Gly Arg
 1 5

gga tcc aag ctt aga tct cga gga cat cac cat cac cat cac 216
 Gly Ser Lys Leu Arg Ser Arg Gly His His His His His His
 10 15 20

tgaactagtc gacccaccgg caccctgag cccctcgctg cgggtgccgg tgcgagggac 276

tgcaacacgc gaaacctgca caaacacacg gaggttgaa tgagcgccac ggacacaccc 336

gataccggcg ccgttcacc ccggttggtg accaccgctg gggcggctga cctgctacgc 396

cgctcagcg ggactctagt 416

<210> 118

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 peptide

<400> 118

Met Gly Ile Leu Arg Ser Gly Arg Gly Ser Lys Leu Arg Ser Arg Gly
 1 5 10 15

His His His His His His
 20

<210> 119

<211> 43

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 nucleotide sequence

<400> 119

gtctagaaat aattttgttt aactttaaga aggagatata cat 43

<210> 120

<211> 81

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 nucleotide sequence

<220>

<221> CDS

<222> (3)..(68)

<400> 120

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cc atg gga att cta cgt agc ggc cgc gga tcc aag ctt aga tct ctc      47
  Met Gly Ile Leu Arg Ser Gly Arg Gly Ser Lys Leu Arg Ser Leu
    1             5             10             15

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gag cat cac cat cac cat cac tgaactagtc gac      81
Glu His His His His His His
                20

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<210> 121

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 121

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Met Gly Ile Leu Arg Ser Gly Arg Gly Ser Lys Leu Arg Ser Leu Glu
  1             5             10             15

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His His His His His His
                20

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<210> 122

<211> 82

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic nucleotide sequence

<220>

<221> CDS

<222> (4)..(69)

<400> 122

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cat atg gga att cta cgt agc ggc cgc gga tcc aag ctt aga tct ctc      48
  Met Gly Ile Leu Arg Ser Gly Arg Gly Ser Lys Leu Arg Ser Leu
    1             5             10             15

```

```

gag cat cac cat cac cat cac tgaactagtc gac      82
Glu His His His His His
                20

```

<210> 123

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 123

Met Gly Ile Leu Arg Ser Gly Arg Gly Ser Lys Leu Arg Ser Leu Glu
 1 5 10 15

His His His His His His
 20

<210> 124

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic nucleotide sequence

<400> 124

gtcagagaag ggagcggcca tg

22

<210> 125

<211> 45

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic nucleotide sequence

<400> 125

gtctagaaat aattttgttt aactttaaga aggagatata ccatg

45

<210> 126

<211> 14

<212> PRT

<213> Rhodococcus erythropolis

<400> 126

Gly'Leu Arg Ser Cys Gly Lys Gly Trp Ile Cys Pro Cys Cys
 1 5 10

<210> 127

<211> 8

<212> PRT

<213> Rhodococcus erythropolis

<400> 127

Met Val Thr Met Thr Met Arg His
 1 5

<210> 128
 <211> 26
 <212> PRT
 <213> Rhodococcus erythropolis

<400> 128
 Gly Cys Asp Gly Tyr Val Arg Ala Val Glu Ile Thr His Gly Lys Asn
 1 5 10 15
 Gly Trp His Val His Val His Ala Leu Leu
 20 25

<210> 129
 <211> 10
 <212> PRT
 <213> Rhodococcus erythropolis

<400> 129
 Leu Ala Ala Tyr Leu Thr Lys Ile Ala Ser
 1 5 10

<210> 130
 <211> 21
 <212> PRT
 <213> Rhodococcus erythropolis

<400> 130
 Trp Arg Glu Phe Glu Phe Gly Ser Met Gly Arg Arg Ala Ile Ala Trp
 1 5 10 15
 Ser Arg Gly Leu Arg
 20

<210> 131
 <211> 14
 <212> PRT
 <213> Arcanobacterium pyrogens

<400> 131
 Gly Leu His Thr Cys Gly Ser Val Trp Ala Cys Pro Val Cys
 1 5 10

<210> 132
 <211> 8
 <212> PRT
 <213> Arcanobacterium pyrogens

<400> 132
 Met Leu Thr Leu Thr Gln Arg His
 1 5

<210> 133
 <211> 26
 <212> PRT
 <213> Arcanobacterium pyrogens

<400> 133
 Gly Leu Val Gly Tyr Val Arg Ala Asn Glu Ile Thr His Gly Lys His
 1 5 10 15
 Gly Trp His Val His Ser His Val Leu Ile
 20 25

<210> 134
 <211> 10
 <212> PRT
 <213> Arcanobacterium pyrogens

<400> 134
 Ile Gly Asn Tyr Val Ser Lys Met Gln Thr
 1 5 10

<210> 135
 <211> 21
 <212> PRT
 <213> Arcanobacterium pyrogens

<400> 135
 Trp Lys Glu Tyr Glu Lys Ala Ser Phe Gly Arg Arg Ala Leu Thr Trp
 1 5 10 15
 Ser Lys Gly Leu Arg
 20

<210> 136
 <211> 8
 <212> PRT
 <213> Brevibacterium lactofermentum

<400> 136
 Met Phe Val Gly Thr Val Arg His
 1 5

<210> 137
 <211> 26
 <212> PRT
 <213> Brevibacterium lactofermentum

<400> 137
 Val Glu His Thr Tyr Ser Asp Tyr Glu Val Thr Asp Ser Trp Ala Asn
 1 5 10 15
 Gly Trp His Leu His Arg Asn Met Leu Leu
 20 25

<210> 138
 <211> 10
 <212> PRT
 <213> Brevibacterium lactofermentum

<400> 138
 Met Ala Thr Tyr Leu Ala Lys Gly Met Ser
 1 5 10

<210> 139
 <211> 20
 <212> PRT
 <213> Brevibacterium lactofermentum

<400> 139
 Trp Arg Glu Tyr Glu Val Gly Ser Lys Asn Leu Arg Ser Ser Trp Ser
 1 5 10 15

Arg Gly Ala Lys
 20

<210> 140
 <211> 14
 <212> PRT
 <213> Streptomyces phaeochromogenes

<400> 140
 Gly Leu Val Arg Cys Gly Arg Ile Trp Phe Cys Pro Glu Cys
 1 5 10

<210> 141
 <211> 8
 <212> PRT
 <213> Streptomyces phaeochromogenes

<400> 141
 Leu Val Thr Phe Thr Ala Arg His
 1 5

<210> 142
 <211> 27
 <212> PRT
 <213> Streptomyces phaeochromogenes

<400> 142
 Gly Tyr Ile Gly Met Val Arg Ala Ala Glu Val Thr Arg Ser Lys Lys
 1 5 10 15

Asn Gly Tyr His Pro His Leu Asn Leu Leu Val
 20 25

<210> 143
 <211> 10
 <212> PRT
 <213> Streptomyces phaeochromogenes

<400> 143
 Leu Ile Glu Tyr Leu Thr Lys Asn Gln Asp
 1 5 10

<210> 144
 <211> 21
 <212> PRT
 <213> Streptomyces phaeochromogenes

<400> 144
 Trp Ala Gln Tyr Glu Glu Ala Leu Ala Gly Arg Arg Ala Ile Glu Trp
 1 5 10 15

Thr Arg Gly Leu Arg
 20

<210> 145
 <211> 14
 <212> PRT
 <213> Streptomyces lividans

<400> 145
 Gly Leu Met Arg Cys Gly Arg Ile Trp Leu Cys Pro Val Cys
 1 5 10

<210> 146
 <211> 8
 <212> PRT
 <213> Streptomyces lividans

<400> 146
 Leu Val Thr Phe Thr Ala Arg His
 1 5

<210> 147
 <211> 26
 <212> PRT
 <213> Streptomyces lividans

<400> 147
 Gly Tyr Val Gly Met Arg Ala Thr Glu Val Thr Val Gly Gln Ile Asn
 1 5 10 15

Gly Trp His Pro His Ile His Ala Ile Val
 20 25

<210> 148
 <211> 10
 <212> PRT
 <213> Streptomyces lividans

<400> 148
 Leu Ala Glu Tyr Ile Ala Lys Thr Gln Asp
 1 5 10

<210> 149
 <211> 21
 <212> PRT
 <213> Streptomyces lividans

<400> 149
 Trp His Glu Tyr Glu Arg Ala Thr Arg Gly Arg Arg Ala Ile Glu Trp
 1 5 10 15

Thr Arg Tyr Leu Arg
 20

<210> 150
 <211> 14
 <212> PRT
 <213> Streptomyces nigrifaciens

<400> 150
 Gly Leu Met Arg Cys Gly Arg Ile Trp Leu Cys Pro Val Cys
 1 5 10

<210> 151
 <211> 8
 <212> PRT
 <213> Streptomyces nigrifaciens

<400> 151
 Leu Val Thr Phe Thr Ala Arg His
 1 5

<210> 152
 <211> 26
 <212> PRT
 <213> Streptomyces nigrifaciens

<400> 152
 Gly Tyr Val Gly Met Arg Ala Thr Glu Val Thr Val Gly Gln Ile Asn
 1 5 10 15

Gly Trp His Pro His Ile His Ala Ile Val
 20 25

<210> 153
 <211> 10
 <212> PRT
 <213> Streptomyces nigrifaciens

<400> 153
 Leu Ala Glu Tyr Ile Ala Lys Thr Gln Asp
 1 5 10

<210> 154
 <211> 21
 <212> PRT
 <213> Streptomyces nigrifaciens

<400> 154
 Trp His Glu Tyr Glu Arg Ala Thr Lys Gly Arg Arg Ala Ile Glu Trp
 1 5 10 15
 Thr Arg Tyr Leu Arg
 20

<210> 155
 <211> 30
 <212> DNA
 <213> Rhodococcus erythropolis

<400> 155
 cgagcgaagc ggagcgcgta ggtgggggag 30

<210> 156
 <211> 27
 <212> DNA
 <213> Arcanobacterium pyrogens

<400> 156
 caggtatgcg gaaaacttta ggaacaa 27

<210> 157
 <211> 32
 <212> DNA
 <213> Brevibacterium lactofermentum

<400> 157
 gaaatagaag tgaacacctc taaggaaccg ca 32

<210> 158
 <211> 31
 <212> DNA
 <213> Streptomyces phaeochromogenes

<400> 158
 ctggcaaaaaa ggagcgccta ggtaaagggt t 31

<210> 159
 <211> 30
 <212> DNA
 <213> *Streptomyces lividans*

<400> 159
 gaggcacaaag cgaacacctt gggaaagaaa 30

<210> 160
 <211> 32
 <212> DNA
 <213> *Streptomyces nigrifaciens*

<400> 160
 gacccaaaac gtgtcgcgcc ttgggaaaga aa 32

<210> 161
 <211> 270
 <212> DNA
 <213> *Rhodococcus erythropolis*

<400> 161
 tgagggcatc ccccgatcac ttgccgcttt gaagctgggt gtctctctgt cagggctgctg 60
 atagcaccgc gtagcggctt ggccttgaca gagagacggc ctgtttcatg gttggctctg 120
 gggggctgac cgggcagata gaaaaaggcc ggccgatttg gctgccgact atttttgcag 180
 gtaaaccat ctcagagca tcaatgaacg tcccgttgta tcgcagcgcg tgcagcttcg 240
 gtagacgtcg atggcgttgt gatgggtgtg 270

<210> 162
 <211> 170
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 nucleotide sequence

<400> 162
 tgtacatata gaggcgggct cccacggccg cccgggctga gggagccgac ggcacgcggc 60
 ggctcacggc gtggcacgcg gaacgtccgg gcttgacact cacgtcacgt gaggaggcag 120
 cgtggacggc gtctagaaat aattttgttt aactttaaga agaagatata 170

<210> 163
 <211> 95
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 nucleotide sequence

<220>
 <221> CDS
 <222> (3) .. (92)

<400> 163

```
cc atg ggc cac cat cac cat cac cat atg gga att cta cgt agc ggc 47
  Met Gly His His His His His His Met Gly Ile Leu Arg Ser Gly
    1             5             10             15

cgc gga tcc aag ctt aga tct ctc gag cat cac cat cac cat cac tga 95
Arg Gly Ser Lys Leu Arg Ser Leu Glu His His His His His His
    20             25             30
```

<210> 164

<211> 30

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 164

```
Met Gly His His His His His His Met Gly Ile Leu Arg Ser Gly Arg
  1             5             10             15

Gly Ser Lys Leu Arg Ser Leu Glu His His His His His His
    20             25             30
```

<210> 165

<211> 99

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic nucleotide sequence

<220>

<221> CDS

<222> (4) .. (96)

<400> 165

```
cat atg ggc cat cac cat cac cat cac gcc atg gga att cta cgt agc 48
  Met Gly His His His His His His Ala Met Gly Ile Leu Arg Ser
    1             5             10             15

ggc cgc gga tcc aag ctt aga tct ctc gag cat cac cat cac cat cac 96
Gly Arg Gly Ser Lys Leu Arg Ser Leu Glu His His His His His His
    20             25             30

tga 99
```

<210> 166
 <211> 31
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 166
 Met Gly His His His His His Ala Met Gly Ile Leu Arg Ser Gly
 1 5 10 15
 Arg Gly Ser Lys Leu Arg Ser Leu Glu His His His His His His
 20 25 30

<210> 167
 <211> 197
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 nucleotide sequence

<400> 167
 actagtcgac ccaccggcac ccgtgagccc ctgctgctggtg ggtccgggtgc gagggactgc 60
 aacacgcgaa acctgcacaa acacacggag gttggaatga gcgccacgga cacacccgat 120
 accggcgccg ttccaccccg gttggtgacc accgctgggg cggtgacct gctacgcgc 180
 ctcagcggga ctctagt 197

<210> 168
 <211> 6
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 6xHis tag

<400> 168
 His His His His His His
 1 5